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10/769,385

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Tienteh Chen

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EXAMINER

TSOY, ELENA

ART UNIT

PAPER NUMBER

1762

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/769,385

Applicant(s)

CHEN ET AL.

Examiner

Elena Tsoy

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 23-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/30/04; 5/23/05</u> | 6) <input type="checkbox"/> Other: _____  |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 17, 2007 has been entered.

Claims 1-37 are pending in the application. Claims 23-37 are withdrawn from consideration as directed to a non-elected invention.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose et al (US 6,203,899) in view of Santo et al (US 5,965,252), Abe et al (US 5,372,884) and Alexander et al (US 3,007,878).

As to claim 1, Hirose et al disclose a method of treating *silica* to change the negative charge on the surface to a positive charge (See column 3, lines 62-67; column 4, lines 1-3) comprising subjecting silica having particle size in the range of 1-500 nm, preferably 10-100 nm (See column 3, lines 52-56) to a surface treatment with a compound containing some of the *cationic* metal oxides or metal atoms (See column 4, lines 18-21) such as alumina hydrate (See

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column 4, lines 3-10); or subjecting silica to a surface treatment with an organic compound having both amino group or quaternary ammonium group thereof and functional group having reactivity to a silanol group on the surface of silica, such as aminoethoxysilane or aminoalkyl diglycidyl ether (See column 4, lines 22-26) by dispersing silica in water to prepare a slurry (See column 15, lines 23-28), heating the slurry a silane such as quaternary ammonium salts (See column 4, lines 23-24) or  $\gamma$ -aminopropyltriethoxysilane while stirring to form cationized silica (See column 14, lines 61-66).

Hirose et al fail to teach that silica is treated with *both* cationic metal oxides and silane.

It is well settled that it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have treated silica in Hirose et al with both the cationic metal oxides and silane.

Hirose et al fail to teach that: (i) alumina hydrate is applied to silica particles first (claimed surface activating agent), then with silane; (ii) silica particles are treated with the cationic alumina and alumina hydrate by dispersing silica particles in an aqueous environment to form an aqueous dispersion (Claim 1).

As to (i), it is well settled that a proper sequence of adding ingredients to obtain the most satisfactory mixture is within a skill of a person of ordinary skill in the art, and such a choice does not involve invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have treated silica in Hirose et al with cationic metal oxides and silane in any order including claimed sequence with the expectation of providing the

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desired cation-modification of silica since it is held that a proper sequence of adding ingredients to obtain the most satisfactory mixture is within a skill of a person of ordinary skill in the art, and such a choice does not involve invention.

Moreover, Santo et al teach that an alumina hydrate surface-treated in an aqueous dispersion (See column 7, lines 52-56) with a silane coupling agent (See column 3, lines 39-44) such as gamma-aminopropyltriethoxysilane (See column 5, line 2) when used in an ink-receiving layer composition provides image formed on the ink-receiving layer with no change in tint and good color reproducibility (See column 2, lines 56-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have surface treated silica particles in Hirose et al first with alumina hydrate in an aqueous dispersion so that silica has on its surface alumina hydrate then subjecting the surface treated silica in the aqueous dispersion to a treatment with an organosilane reagent such as aminoethoxysilane with the expectation of providing image formed on an ink-receiving layer with no change in tint and good color reproducibility, as taught by Santo et al.

As to (ii), Abe et al teach that a cation-modification of colloidal silica for the use in an ink receiving layer (See column 2, lines 28-34) by coating with a hydrous metal oxide such as hydrous aluminum oxide, hydrous zirconium oxide, hydrous tin oxide or the like can be carried out by the method described in US 3,007,878 to Alexander et al (See column 2, lines 41-58). Alexander et al teach that the method comprises mixing a 30% aquasol of colloidal silica (See column 7, lines 56-57) with an aqueous solution of a basic salt of a polyvalent metal such as 1 M/L (See column 7, lines 63-66) basic aluminum chloride (See column 4, lines 9-10) to coat the silica particles with an oxygen compound of the polyvalent metal and thereby forming a stable

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aquasol of positively charged coated silica particles (See Fig. 2; column 1, lines 58-63; column 2, lines 1-40; column 4, lines 1-19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out coating of colloidal silica with alumina or alumina hydrate in Hirose et al by contacting colloidal silica in an aqueous dispersion with a basic salt of a polyvalent metal such as aluminum in an aqueous solution with the expectation of providing the desired cation-modification, as taught by Abe et al and Alexander et al.

As to claims 2-4, it is held that a proper sequence of adding ingredients to obtain the most satisfactory mixture is within a skill of a person of ordinary skill in the art, and such a choice does not involve invention.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have mixed colloidal silica and a metal salt solution in Hirose et al in view of Abe et al and Alexander et al in any order including claimed sequences and portion-wise addition with the expectation of providing the desired cation-modification of silica since it is held that a proper sequence of adding ingredients to obtain the most satisfactory mixture is within a skill of a person of ordinary skill in the art, and such a choice does not involve invention.

As to claims 5, 9, 16, and 18, It is held that concentration limitations are obvious absent a showing of criticality. Akzo v. E.I. du Pont de Nemours 1 USPQ 2d 1704 (Fed. Cir. 1987).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant concentration parameters (including those of claimed invention) in Hirose et al in view of Abe et al and Alexander et al through routine experimentation in the absence of showing of criticality.

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As to claim 6, it is well known in the art to use high shear mixer in obtaining thoroughly mixed dispersion.

As to claims 11 and 20, It is the Examiner's position that alumina or alumina hydrate is adsorbed on the surface of silica because it is treated by a process substantially identical to that of claimed invention.

As to claim 14, Alexander et al teach that the positive charge density and degree of metal oxygen compound coating of the silica particles are important factors in establishing stability of the resulting sol (See column 6, lines 17-20), which factors depend on concentration of a metal compound and pH of the system (See column 6, lines 20-38). In other words, pH of the system has to be maintained at a predetermined level, i.e. should be monitored.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have monitored pH of a system in Hirose et al in view of Abe et al and Alexander et al and maintained at a predetermined level with the expectation of providing the desired positive charge density and degree of metal oxygen compound coating on the silica particles since Alexander et al teach that the positive charge density and degree of metal oxygen compound coating on the silica particles are important factors in establishing stability of the resulting sol, which factors depend on concentration of a metal compound and pH of the system.

As to claim 15, Hirose et al disclose a method of preparing an ink-jet media sheet (See column 3, lines 4-13), comprising preparing a porous coating composition (See column 4, lines 60-63) comprising cationized silica (See column 3, lines 62-67; column 4, lines 1-3); and coating the porous coating composition on a media substrate (See column 4, lines 40-43).

***Response to Arguments***

3. Applicants' arguments filed May 17, 2007 have been fully considered but they are not persuasive.

Applicants maintain their arguments that a prima facie case of obviousness with respect to pending claims has not been met.

The Examiner respectfully disagrees with this argument. According to MPEP, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation in the **references themselves** to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Combination of Santo et al, Abe et al and Alexander meets all three basic criteria.

Hirose teaches cationizing silica with either cationic metal oxides or silanes. It is well settled that *combining* both treatments and a *proper sequence* of adding ingredients including claimed order (applying metal oxides first then silanes) is prima facie obvious in the absence of showing of criticality. Therefore, (i) a **combination of treatments** would be obvious to one of ordinary skill in the art; (ii) claimed **sequence of treatments** would be also obvious. Santo is applied to show that claimed order have other advantages. Thus, in contrast to Applicants argument, there is a suggestion or motivation to combine cited references.



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One of ordinary skill in the art would have reasonable expectation of success because Abe et al and Alexander show that claimed method of applying metal oxides was well known in the art.

And finally, the cited prior art teaches or suggests all the claim limitations.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy  
Primary Examiner  
Art Unit 1762

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June 19, 2007